**Title:** **Launch Pad from High School to NASA: A Research and Training Program in STEM Fields**

**Institution:** **Regents of The University of California at Riverside**
**City/State:** **Riverside, California**
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**Summary:** The aim of this proposal is to establish a comprehensive program as directed by the Launch Pad MUREP Aerospace Academy (MAA), to deploy K-12 Out-of-School Time student experiences. The objective of this program is to "Advance the Nation's STEM education and workforce pipeline by working collaboratively with other agencies to engage students, teachers and faculty in NASA's missions and unique assets" as stated by NASA. The program will be performed within the existing infrastructure built for the NASA MIRO program at the University of California Riverside (UCR), a Hispanic Serving Institution (HSI) as designated by the U.S. Department of Education.

The Launch Pad will well complement the ongoing 5-year partnership program between UCR and NASA's Jet Propulsion Laboratory (JPL), funded in 2016 as MIRO project NNX15AP99A- "MIRO Fellowships and Internships in Extremely Large Data Sets (MIRO
FIELDS)." The FIELDS program that is designed to cover undergraduate, graduate, and postdoctoral research and training in Data Science was extended with a modest K-12 component engaging high school students in the Riverside Unified School District (RUSD).
This was to create a STEM pipeline to recruit minority students from high schools and provide them the opportunity to enter into a STEM discipline in college. Following the success of this pilot program, RUSD provided additional matching funds to support 30 high school students in Summer Academies per year (in addition to the 30 high school students supported each year by the FIELDS).

Launch Pad will establish a dedicated program and will double the number of participants. It deploys computers and graduate student mentors for Python coding, at four high school campuses. Summer Academy for students consists of college-level coursework (with transferable credit) for 5 weeks. Summer Academy for teachers lasts two weeks and will pay an allowance of $500 to every teacher successfully completing the course. A group of 3 to 5 competitively selected high school students will receive research opportunity to work throughout the academic year on Capstone Projects in STEM at UCR. Over the last three years, the pilot project for high school students has been extremely successful with its
Capstone alumni accepted to MIT, Berkeley, Cal Tech, and many top graded universities nationwide. About 90% of those students have been members of minority groups. Launch Pad will support 30 more Summer Academy students, 20 teachers, and 10 to 15 more

Capstones per year. In terms of numbers of students affected, the Summer Academy for teachers has the highest impact because they incorporate content into courses during the school year, with sustained impact.

Launch Pad implements outreach to parents and the public with parent nights (in both English and Spanish) scheduled twice a year, telescope “sky nights” that reach 6,000 elementary to high school students per year, 6 to 8 public lectures at high schools and local libraries. Cosmic Thursdays every month offer presentations on NASA-related topics. A new component for Launch Pad will include one-day group (3-5 students) hands-on science and engineering experiences in UCR labs, mentored by grad students and faculty. As a part of their fellowship, the graduate students supported by the FIELDS NASA-MIRO program will be responsible for providing training for the high school students. That includes: mentoring in Python programming, guidance on coursework and preparation for college, and assistance with Capstone Projects. This helps to enrich opportunities for predominantly Hispanic high school students and gives grad students valuable experience in presenting material and coaching young people in grades 9-12. The Launch Pad provides annual workshops at UCR campus for the high school students to give presentations of their research project, display posters, take part in question and answer sessions and establish connections with NASA scientists.